CAP-A – Raising Privacy Awareness Depends on Us!

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CAP-A is offering socio-technical tools to promote collective awareness and informed consent, whereby data collection and use by digital products are driven by the expectations and needs of the consumers themselves.

Consumers are currently generating vast amounts of data, mostly through applications installed in a consumer's smart device, such as mobile phone, smart TV, etc. Since much of this data is personal, it is important for users to know everything about the use of their data, including whether apps are compliant with the recently established GDPR legislation, or which device permissions are mandatory and why.

However, this is practically impossible, since the utilization of such data by apps usually is hidden behind vague privacy policy documents, which are often lengthy, difficult to read (due to the legal terms and definitions they contain) and frequently changing.

At the heart of CAP-A project [L1] is the hypothesis that **data protection can also be powered by the society itself**. By mobilising consumers to become active players in digital marketplaces and by developing tools to harness our collective power, the adoption of the technical and regulatory frameworks can become more effective and ubiquitous, and the market will act with responsiveness, mostly because it is profit-maximizing.

Towards this end, CAP-A is offering socio-technical tools to promote collective awareness and informed consent, whereby data collection and use by digital products are driven by the expectations and needs of the consumers themselves.

The CAP-A Tools

In the course of the CAP-A project, we developed a set of tools that employ crowdsourcing techniques to support consumers in **expressing their privacy concerns and expectations** (Figure 1), **annotating PrP documents** (Figure 2), and **better understanding privacy-related information** regarding the used apps [1].

The **CAP-A tools** are available online and are freely offered for anyone to use [L2]. They include a **CAP-A portal** and an accompanied native Android **CAP-A app**. The CAP-A project is part of the CAPrice initiative [L3], a grassroots community with the goal of applying crowdsourcing solutions to raise awareness and provide solutions to privacy-related matters.

The CAP-A approach results in the assessment of mobile apps along two different *metrics* (Figure 3), which quantify their privacy-related behaviour, as judged by the consumers' contributions. To enhance participation and provide motivation for active contribution to the platform, we apply a unified *rewarding strategy* [2] that includes gamification features for active consumers and developers such as *points* and *tiers* for users (Figure 4).

Results

The CAP-A portal digested privacy-related information about more than **19K Android apps,** which is available for users to explore. During the project, 164 users registered and used the CAP-A portal, whereas 51 users installed the mobile app. Their contributions resulted in the expression of personal expectations for about 567 apps and in 1181 annotations on different Privacy Policy documents.

Beyond the portal and the project website, our communication and dissemination activity reached hundreds of users in social media, helped grow the CAPrice Community, namely the mailing list by 240% (455 users, as of April 2021) and the total community size, including social media followers, by 143% (**1563 users/followers/subscribers, as of April 2021**). The CAP-A project appeared in 7 scientific venues and 12 wide public events.

Considering the above, one of the main objectives set in the beginning of the project, i.e., to attract the interest of a considerable number of users to start generating *informative privacy norms*, has been achieved. The CAP-A dashboard, which is encapsulated in the CAP-A portal, provides a wealth of statistics, as for example the percentage of consumers who found reasonable to give access to a certain type of data, such as camera or contacts, for a given app category [L4]. This information can be used by different stakeholders (developers, social scientists, policy makers) to conduct analyses and interpret the behaviour and mind-set of various user groups, according to age or other demographic characteristics.

But nothing would have happened without consumers' contribution. Therefore, it is critical for the formulated CAPrice community to become self-sustainable and grow, in order to increase the number of user contributions in the CAP-A tools. Our aim is for consumers to realize that raising privacy awareness depends on all of us.

Project Details

The CAP-A project received funding from the European Union's Horizon 2020 research and innovation programme under the NGI TRUST grant agreement no 825618. The project began in August 2019 and was planned to run for one year; however, due to the COVID-19 pandemic, an extension until the end of 2020 was granted. The project consortium consisted of FORTH and IN2 Digital Innovations. FORTH is the largest research institute in Greece; FORTH coordinated the project and participated with the Institute of Computer Science (ICS) and the PRAXI Network. IN2 Digital Innovations, is a software development company offering web-based solutions. Through CAPrice, the outcomes of the project will be maintained in the future. However, to fund additional development and feature improvements, other sources of income will also be considered.

Links:
[L1] https://www.cap-a.eu
[L2] https://www.cap-a.eu/tools/
[L3] https://www.caprice-community.net/
[L4] https://cap-a.eu/portal/#stats

References :

[1] I. Chrysakis et al., "Evaluating the data privacy of mobile applications through crowdsourcing," in Legal knowledge and information systems, virtual event, 2020, vol. 334, pp. 219–222.
[2] I. Chrysakis, G. Flouris, T. Patkos, A. Dimou, and R. Verborgh, "REWARD : ontology for reward schemes," in Proceedings of the 17th Extended Semantic Web Conference (ESWC-2020), May 31–June 4, Heraklion, Crete, Greece, 2020.

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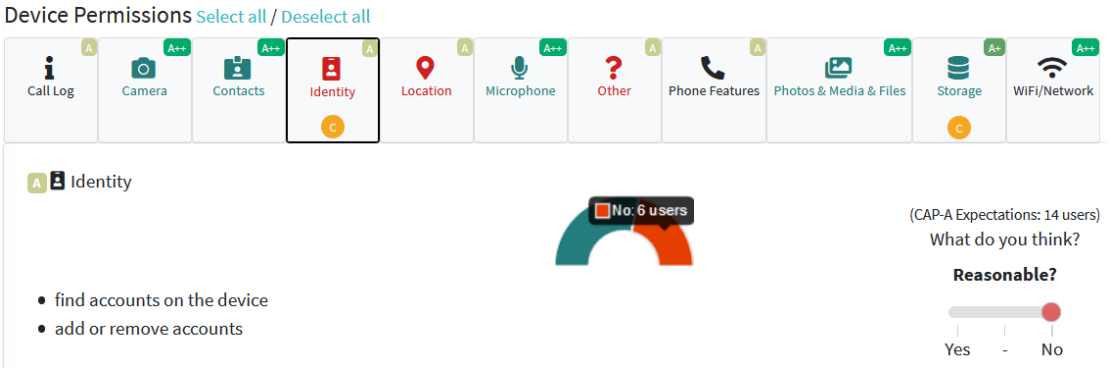

Figure 1: Expressing privacy expectations in CAP-A

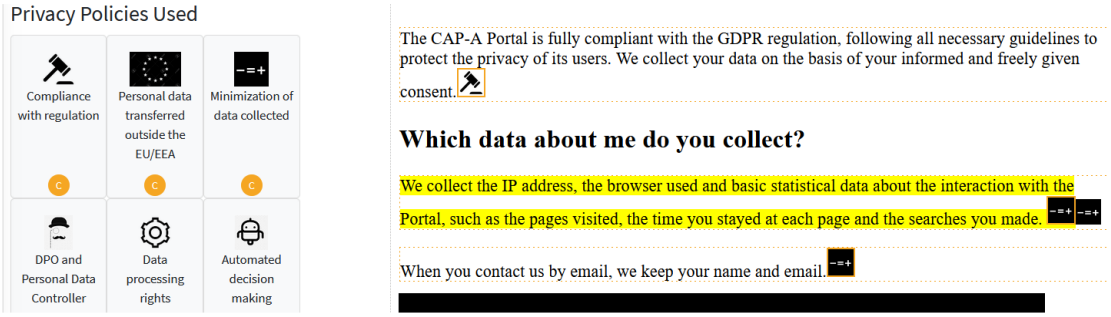

Figure 2 Annotating the PrP document of an app with CAP-A

Score	Satisfaction of Community's Expectations (%)	Privacy Friendliness (%)
A++	80 ≤ A++ ≤ 100	80 ≤ A++ ≤ 100
A+	60 ≤ A+ < 80	60 ≤ A+ < 80
A	40 < A < 60	40 < A < 60
B	20 < B ≤ 40	20 < B ≤ 40
C	0 ≤ C ≤ 20	0 ≤ C ≤ 20

Figure 3 Visual Cues of CAP-A: Community metrics

Tier	Icon	Required Points
Baby		0
Novice		100
Grown Up		300
Enthusiast		400
Warrior		1000
Expert		2000
Guru		10000
Royal		20000

Figure 4 Visual Cues of CAP-A: Rewarding Tiers